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Laying Foundations For BRIGHT FRUIT CAMPAIGNS

HOW FLORIDA CITRUS INDUSTRY HAS FINISHED THAT TASK USING EXPERIMENT STATION RESEARCH AS CORNERSTONE

BY JEFFERSON THOMAS

When the bright young men from the North who write the advertisements for the State Citrus Commission coined the phrase "Quality controlled by the State of Florida" they started something. Indirectly in consequence thereof, if not directly, the fruit industry is preparing to get busy on the problems connected with producing bright fruit, thus taking Florida citrus from the classification it and the weather long have shared, as described by the quotation erroneously credited to Mark Twain, "Everybody **talks** about what is wrong but nobody **does** anything."

Quality might have been represented as assured or insured, as guaranteed or warranted, as inspected or protected, and the assertion much less frequently challenged. Use of the comprehensive "controlled", with the far-reaching significance and widely-inclusive implications which the word carries, was quite another matter. "Control" is too much in the public mind these days, as this and that comes under government supervision, for the meaning to be missed when mention was made of it as a state function.

Into the history of the Florida citrus industry has been introduced, therefore, a movement for cleaning house with respect to oranges and grapefruit presenting other than bright, clean appearance when they are paraded before possible purchasers. While in organization and scope the latest activity will go far beyond previous endeavor, the effort is by no means new and success for the campaign will mean the culmination of preceding work along the same line, extending over many years.

Foundations for the structure of accomplishment it is proposed to erect through the bright fruit movement have been laid, in fact, by workers under the state farm service agencies at Gainesville, who started plugging away at the task many years ago.

Causes of Discolored Fruit

Rust mites have been recognized for a long time as a major cause of discolored fruit. Melanose more recently has come to be regarded as but slightly less of a contributing factor. Thrips, wind-whipping of trees and some citrus diseases also have been found to play not inconsiderable parts in reducing the proportions of the grapefruit and orange crops that could be graded as "brights". Florida Agricultural Experiment Station research has dealt efficiently with all these elements in the situation.

Entomology department head, J. R. Watson, is not old enough to remember when he commenced talking about rust mites. Records and recollections are available, however, showing that he has been discussing the pesky creatures during most of his twenty-five years service with the institution. Fighting them he personally began in real earnest, Professor Watson confesses, after acquiring grove property some eight or ten years since.

Recalled by his predecessor, Dr. E. W. Berger, now State Plant Board Entomologist, by Dr. P. H. Rolfs, formerly the Experiment Station's director, and by H. Harold Hume, present vice-director in charge of research, all of whom were associated with the institution back in the Lake City days which ended during 1907, is the fact that even then bright fruit production was a matter of concern.

Twenty-five years plus one covers

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A General Summary Of Insect Conditions In Florida . . . . .

J. R. WATSON
Entomologist, Florida Experiment Station

Just how "buggy is Florida? Newcomers to the state often express the opinion that insects are particularly abundant and troublesome in Florida, that it is difficult to raise a crop and that they are a continual pest to the housewives the year round. They commonly attribute this unhappy supposed condition to the absence of heavy frosts and freezes. It is indeed true that our insect season, like our growing season and everything else, is long. In fact, for many insects it includes the entire year. Frosts and freezes do exterminate some insects but the vast majority of them are simply put into a quiescent stage, into hibernation, to come out again in the spring. Another side of the subject, we must remember, is that not all insects are injurious. Indeed, only a very small minority are highly injurious. Many of these are not native but introduced. Practically all of the worst of the scale insects of citrus, for instance, and the whiteflies, have been introduced. The same is true of the San Jose scale on citrus trees. Even of those which are injurious, the vast majority of them never get abundant enough to be a serious pest. For instance, over 200 insects have been recorded as attacking citrus in Florida, but those which are serious and against which the grower needs to take measure nearly every year can be counted on the fingers of your hands.

Fully as many insects are beneficial as are injurious; predacious and parasitic insects, ground beetles, ladybeetles, dragon flies, most of the huge order of hymenoptera which includes wasps and bees, bany bugs and mantids, to name only a few. Our long growing season is just as favorable for their multiplication as it is for the injurious ones. Furthermore, Florida has one advantage in which she far surpasses any other state in the Union, namely: the great number and abundance of parasitic diseases which attack insects, the so-called entomogenous fungi, as well as bacteria. Due to our humid and hot rainy season these develop far in excess of the numbers in any other state. So common and efficient are they in the summer time that it is impossible to convince entomologists of other states who have never visited Florida at that time that they are so common and beneficial. A few years ago the writer had the privilege of showing a famous Italian entomologist, Silvestri, part of the State. Doctor Silvestri was astonished at the numbers of our entomogenous fungi. Most entomologists take the attitude the Louis Agassiz is said to have taken to the 17 years cicada locust. When told that these insects spent 16 years in the ground and came out in the 17th year and practically all came out at the same time, it is said he told the narrator he could go down to the port and tell that story to the Marines, not to tell it to him.

Our citrus growers are all familiar with the entomogenous fungi, those which attack and hold in check during the summer time the scale insects, whiteflies, rust mites and mealy bugs. The velvet bean caterpillar is brought under control every September by a fungus disease. In the 24 years that the speaker has been in the State he has never known it to fail.

House flies are not nearly as troublesome as they are in the northern states, largely on account of the prevalence of a fungus disease. Of course, it is unfortunate that these diseases attack friends as well as foe. Ladybeetles, for instance, are very commonly attacked by a disease which seriously interferes with their multiplication. It is partly freedom from these diseases which has made the Chinese ladybeetle (Leis), introduced by the Experiment Station, so effective in that part of the State where it has become established.

Many severe pests of the northern farmers are not found in Florida, or are much less common and injurious. To mention a few, the Mexican bean beetle makes it necessary for the bean growers in all the States east of the Mississippi, except Florida and Louisiana, put up a constant fight. Not only is this pest not found in Florida, but apparently it is unable to establish itself here as the one colony found at Monticello, like the one found at Valdosta, Georgia, has died out of its own accord. In the north growers must fight the Colorado potato beetle constantly. Although this pest is found in the northern part of Florida it is not nearly the pest it is in the northern states, chiefly because it does not come out of hibernation until the potatoes are well grown. The chinch bug, which is a severe pest of corn, oats, and wheat in the northern states, particularly in the central states of the Mississippi Valley, in Florida attacks nothing but St. Augustine grass in injurious numbers. Why it fails to attack corn and oats in Florida is a mystery. Millions of dollars have been spent in the northern states fighting the European corn borer, a pest we do not have. The same is true of the Japanese beetle which is an extremely severe pest in the northeastern United States. This may in time reach Florida as it is as far south as South Carolina now. The Asiatic beetle is another pest we do not have. The gypsy and the brown-tailed moths make it necessary to spray shade and forest trees in the northern states. So, the insect situation in Florida, on the whole, is probably no worse than that of any other state.

Of course, many of the insects we have are new to newcomers to the State, but much of the nervousness is unnecessary, purely psychological. A dread of spiders, for instance. The only dangerous spider we have in Florida is the Black Widow, which is found all over the United States. I have never heard of one being in a house. The most dangerous insect in Florida is, of course, the mosquito, and due to our extensive marshes and swamps we do have more of these than is our share; but our open lakes are mostly free of them and the more progressive communities have learned to fight this menace.

U.S. Department of Agriculture

U. S. Department Of Agriculture Boon To Farmer, *says* FORTUNE

A relentless warfare is being waged by Uncle Sam to protect America's food supply against insect pests and cattle diseases, which even under control cause an annual loss of more than one billion dollars, Fortune magazine points out in an article in its April issue revealing the remarkable achievements of the U. S. Dement of Agriculture. Nearly 50,000 men and women, spending millions of dollars annually, make up the vigilantes in the department. Without them to curb the hosts of plant diseases and insect pests clamoring to become naturalized in this country, the United States might soon be transformed from a land of plenty into a land of famine, in which the AAA and other plans for crop control would be superfluous.

"The Department of Agriculture through the central agency of the Bureau of Entomology and Plant Quarantine maintains what is probably the longest battle line on earth —a quarantine against plant and animal diseases, embracing not only the continental United States but the sea islands as well. Prior to the establishment of that line foreign pests entered the United States at such a rate that the American pest population has become half immigrant and half native," continues Fortune. "The immigrant colony is capable of inflicting a billion dollars worth of annual injury to crops, animal and vegetable. Among the successful invaders are the European corn borer, which torments the gardeners and feed-corn growers of the Northeast, the Hessian fly, which ranks as the most dangerous insect enemy of the wheat farmer, the gypsy moth, which strips whole forests in the summer, the white-pine blister rust, which may yet turn out to be the lumberman's worst enemy, the boll weevil, which can reduce a cotton surplus but can also destroy a cotton crop, and that hun among the plagues, the chestnut blight, which brought down the noblest tree and the best fence-post producer in the North, strewing the hillsides and the wood lots with its sad, skeleton-colored boles. What would happen to the American farmer if the department's line of defense were again thrown down may be judged both statistically and historically.

"Statistically the statement is this: The department makes about 45,000 interceptions of dangerous plants and insects along the U. S. border every year," explains Fortune. "Since it established its defenses only one major pest of any kind has reached the country: the Mediterranean fruit fly which secured a wing hold in Florida but has since been encircled and mopped up in a local guerilla operation. So far as serious livestock maladies are concerned, eleven of the thirty-five known varieties have been kept out of the U. S. by God's grace and the watchfulness of the department's agents. Of the remaining twenty-four, seventeen are either under control or practically eradicated. A comparison of this performance with the record of the four years just prior to 1912 when the department's quarantine began will give some idea of what could happen again. Six of the worst foreign pests known to American farmers entered the country in that period. With each farmer remitted to his own efforts and the 45,000 members of the annual expeditionary force permitted free entry, American crop losses would rise wildly and disastrously."

Although the U. S. Department of Agriculture has accomplished "what no farmer and no stateful of farmers could accomplish," its work in carrying out its federal barricade might conceivably be arguable as being frankly unconstitutional, continues Fortune, "in the light of the Supreme Court's most recent decision on the subject, since agriculture is of local concern and each of the forty-eight sovereign states should be permitted to die of its own pests. So far, however, no lawyer has been ingenious enough to object and the federal government holds the lines on the mere warrant of necessity since no state can hold them in its place. The European corn borer has been slowed down by intrastate (not interstate) quarantines to twenty-five miles a year and foreign parasites appreciative of the fat flesh of that loathsome worm have been discovered abroad, acclimatized, and set upon the flanks and rear of the invading army.

In the Boston area, center of this operation, the mortality of the borers has been one in three and it is the hope of the department that by the time the borers reach the corn belt their morale will have been entirely undermined. A similar and more recent operation has been fought in the same general area against the Dutch elm tree disease introduced into Ohio by importers of veneer. Whipped in that state, the disease reappeared in the New York area where 14,000 infected trees have already been found and destroyed."

Turning its attention to the work of the department in improving crops, Fortune says that "it is not too much to say that without the department's work in discovering, importing and breeding new plants the agricultural crops of the United States would be entirely different, large areas would either be unplanted or planted to less profitable varieties and species, and the whole farming economy would be definitely and obviously inferior. Not only does the department fight the farmer's insect enemies for him and find him new and more profitable plants, it also wrestles with his economic problems. The AAA, which was generally taken as a revolutionary departure, merely followed in a well-tramped path. For years the department has supplied farmers with crop reports which helped them to avoid glutted markets and plan their activities with some foresight. In addition it has made numerous chemical and scientific attacks upon problems presented by specific surpluses of farm products. The citrus growers of California, for example, had surpluses some years ago which not only yielded nothing but cost $1 a ton for removal. An appeal to the department produced a solution. A fruit chemist was sent to Sicily to study local utilization of the lemon crop, a laboratory was set up in Los Angeles, and a horticulturist was supplied. The result was the development of a technical process for the manufacture of citric acid

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Citrus Fruit Industry & Trade, Marketing Agreements

Tentative Approval Given Florida Citrus Agreement

A marketing agreement designed to adjust shipments of Florida grapefruit, oranges and tangerines more nearly in accordance with market demands so that returns to growers may be increased, was tentatively approved by Secretary of Agriculture Wallace on March 10. Copies of the agreement are being sent to Florida shippers for signature by the Agricultural Adjustment Administration.

Growers will consider the proposed program in a series of meetings which will be conducted by the University of Florida agricultural extension service. Before the program can become effective, the agreement must be signed by at least 50 percent of the shippers, and the Secretary must find that issuance of an order which embodies the terms of the agreement is favored by two-thirds of the growers by number or volume of fruit produced.

Important provisions of the marketing agreement relate to regulation of the quantity of fruit shipped, limitation of shipments of any size and grade lower than U. S. No. 2 for Florida citrus fruit, and the establishment of a Control Committee to administer the program.

Under the terms of the marketing agreement program shipments of grapefruit, oranges and tangerines grown in the State of Florida which are moved in interstate commerce and to Canada could be regulated during weekly periods so as to prevent depressing of prices on account of excessive supplies in the markets. Administration of the program would be in the hands of a Control Committee of eleven members who constitute the Florida Citrus Commission.

During the periods of regulation of shipments, each handler of fruit would apply to the Control Committee for allotments and for an allotment base on each variety of fruit concerned. The Control Committee would compute allotments on the basis of either the handler's past performance or his current control of fruit, but unless he requests otherwise, the handler's base would be computed and issued on past performance.

A handler's past performance base would be established upon the average quantity of each variety shipped by the applicant in the 3-year period before September 1 of the then current shipping season. A handler's current control base would be fixed upon the quantity of fruit to which the applicant has title or has authority to ship. New handlers would receive bases in accordance with individual trade outlets or other relevant factors which the Control Committee may consider.

Under the marketing agreement program the Control Committee would recommend to the Secretary of Agriculture the establishment of weekly periods during which shipments to market would be regulated. In its recommendation the Control Committee would indicate the total quantity of each variety of the fruit it deems advisable to be shipped during the weekly period in which regulation is intended, and the allocation of the advisable quantity of each variety of fruit among handlers on a current control base and handlers on a past performance base. The portion of the total advisable quantity allotted to handlers on a current control base would be that percentage which the quantity of fruit represented by the aggregate of their allotment bases bears to the total quantity of fruit then available for shipment throughout the season. The remainder of the total advisable quantity of fruit to be shipped represents the quantity to be allocated among all other handlers on a past performance basis.

Allotments to individual handlers would be made in the proportion that each handler's allotment base bears to the total of the allotment bases for the group to which he belongs, whether current control or past performance.

In order to provide flexibility in practical operations of shippers, the marketing agreement would permit over-shipments and under-shipments to the extent of not more than 10 per cent of each handler's allotment, but such over-shipments, if made, must be deducted from the shipments of the next period. Allotments may be loaned from one shipper to another, and an applicant may change the basis of his allotments from past performance to current control once during a shipping season.

A provision in the agreement would authorize the limitation of shipments of grades lower than U. S. No. 2 for Florida fruit or of any size or any variety of fruit when excessive quantities of such grades or sizes are causing an undue lowering of the price level of all grades and sizes. Methods of exemption are provided for producers who would be unable, as a result of such grade and size regulation, to ship as large a portion of their crops as the percentage of the total crop actually shipped.

The most of administering the marketing agreement program would be borne by the handlers on the basis of the volume of fruit shipped. The agreement provides that handlers pay to the Control Committee one-half cent per standard box shipped from the time the program becomes effective to September 1, 1936, and one-quarter cent per standard packed box on shipments after September 1, 1936. This assessment may be increased or decreased as found necessary, and upon termination of the program, funds collected in excess of expenses would be disbursed among handlers on a pro rata basis.

The agreement provides that the Secretary may terminate it at any time on one day's notice, or it may be terminated upon the request of signatory handlers who can show that they control the distribution of not less than 67 percent of the then remaining fruit subject to regulation during the 1936-37 shipping season. Unless otherwise terminated, the agreement will expire at midnight, July 31, 1937.

The proposed marketing agreement program was considered at a public hearing held at Lakeland, Florida, February 27. In providing for regulation of total shipments in interstate commerce and Canada, the tentatively approved agreement omits auction proration. Testimony at the Lakeland hearing indicated some difference of opinion on the desirability of auction proration but representatives of the industry generally showed a willingness to compose their differences at this time by omitting auction proration from this program.

The tentatively approved marketing agreement program is designed to improve marketing conditions and

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Fertilizing

The Use Of Fertilizer On Florida Soils

BY R. W. RUPRECHT,
CHEMIST,
FLORIDA EXPERIMENT STATION

Most newcomers to the state, on seeing the soils which predominate, cannot understand how such bountiful crops can be grown on such apparently poor or infertile soils. Having grown up in regions where the soils contain considerable amounts of clay or humus, or both, and where sandy soils are considered useless, their perplexity is not to be wondered at. The answer is found in the judicious use of commercial fertilizer coupled with adequate water either in form of rain or as irrigation water, and suitable atmospheric temperatures.

With the exception of the Everglades soils the use of fertilizer in varying amounts is essential for the production of practically all cultivated crops. The amounts of fertilizer necessary and the formula will, of course, vary with the crop and the soil.

For most crops from 1500 to 3000 pounds per acre of a fairly high grade fertilizer is used. A formula that is used for a larger number is one that contains 5% ammonia, or 4.1% nitrogen, 7% of available phosphoric acid and 5% potash.

For tomatoes a fertilizer higher in potash is used, the most common formula being 4% ammonia, or 3¼% nitrogen, 8% available phosphoric acid and 8% potash.

For celery a formula containing 5% of each of the elements—ammonia, phosphoric acid and potash, has long been the favorite. In recent years as a result of fertilizer experiments by the Experiment Station in cooperation with the Federal Government, some growers have been using a formula containing 6% ammonia, 2% phosphoric acid, and 8% potash. Celery growers use considerably more fertilizer per acre than is used for any other crop. Applications of as high as five tons per acre have been found profitable, while three tons is a common amount used.

Of course, it must be understood that where large amounts of fertilizer are used, it is not all put on in one application. Generally a light application is made before the seed is sown or the crop is set, and the balance of the fertilizer is applied as side applications varying in number with the crop from two to five or more. In some cases the side applications are made with nitrogen alone, or with nitrogen and potash. Nitrate of potash, nitrate of soda, sulfate of ammonia and calcium nitrate all being used for this purpose.

These formulas are used simply as illustrations of the general type of fertilizers used and are by no means the only ones used. Last year around 400 different formulas were registered with the Commissioner of Agriculture. While it is true that in many cases only a few tons of a formula were sold, yet even omitting these, still left a much larger number of formulas than we feel are necessary. Probably a dozen or two different formulas would give just as good results.

As for sources of plant food in the above mentioned formulas there is probably no one best combination. The combinations giving the best results this year may give the poorest results next year, if climatic conditions are distinctly different.

There has been a distinct tendency during the past five years or so toward the use of more inorganic and synthetic fertilizer materials due to their lower cost. With the advent of the synthetic high analysis materials there has been a gradual tendency to use higher analysis formulas. In the majority of cases where care was used in making applications just as good results were obtained with higher analysis fertilizers.

With the continuous cropping of the soil the use of synthetic or purified chemical fertilizers we have found in some cases crop yields declining, or crops suffering from malnutrition due to the lack of certain elements which were considered present in adequate amounts in the soil. In truth most of these elements while present in most soils were also being added in our fertilizer when these were made largely from vegetable or animal matter and natural fertilizer materials. No one realized that in trying to provide the farmers with a higher grade fertilizer at a lower cost, the manufacturers were at the same time robbing the fertilizers of some of the essential elements. Thus we have found that zinc sulfate, copper sulfate, borax, magnesium or sulfur, or a mixture of two or more or these elements, when added to certain soils will correct the malnutrition of the crops grown. Whether or not these elements act as direct plant foods, or act indirectly by correcting a soil condition has not yet been definitely established.

Another point in the use of fertilizers is receiving more attention, namely, whether the ultimate results of using the fertilizer will affect the soil reaction; that it, will ie. increase the soil acidity, decrease it, or leave it as it is. With our sandy open soils this question is not as important as on the heavier types of soil. The subject of acidity of soils and its correction has already been discussed on previous occasions, so will not be further discussed here. It is not enough to say that no amount of fertilizer can produce good crops if the soil is too acid or too sweet for that particular crop. Therefore, before growing a crop, it is always best to make sure that the soil reaction is correct. It is far easier to correct this condition before the crop is planted than after the crop is up and growing.

While the use of fertilizer for citrus and other tree crops has not been

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BETTER FRUIT CAMPAIGN

For many years Florida citrus growers and marketing agencies and others have been talking of the need for producing better fruit and fruit of better appearance. Research men of the federal and state experiment stations have stressed the necessity for such action on the part of the growers. Horticultural and agricultural publications, including The Citrus Industry, have devoted column after column and page after page to the subject, but, as Jeff Thomas says in an article in this issue, "very little has been done about it."

Now, however, it appears that a concerted effort is to be made to actually do something. Under the auspices of the Florida Citrus Commission a Better Fruit Campaign has been launched in which Federal and State agricultural agencies, the insecticide industry and every active agency of the citrus industry will take part. A comprehensive, far-reaching and concerted effort will be made to carry out a program for the production of better fruit of the highest internal quality and the brightest exterior appearance.

Stressing the importance of this program, Mr. E. W. Hartt of Avon Park, a member of the Commission on the advisory committee in charge of the program said:

"To successfully advertise and sell Florida citrus fruit in competition with oranges and grapefruit from other states we must make it look equally attractive. It is not enough that our fruit is of better eating quality, it must look better, too, for consumers generally prefer clean, bright fruit. The purpose of this campaign is to improve the general appearance of fruit leaving the state. We must do this to meet Texas and California competition."

Florida's foremost citrus authorities have been brought into agreement on what sprays and dusts to use, and when to use them. These recommendations have been incorporated in a new citrus spray and dust schedule which will be distributed to all growers in the state.

Details of the campaign are being handled by an advisory committee consisting of representatives of the Agricultural Extension Service, Agricultural Experiment Stations, United States Department of Agriculture, State Plant Board, insecticide manufacturers and grove consultants.

Meetings will be held in all parts of the state to acquaint growers with the need for insect and disease control and the opportunity for increasing their returns through the production of better and brighter fruit. Reports will be issued on crop conditions, with additional spraying and dusting suggestions to meet new conditions as they develop.

This is one of the most important campaigns ever conducted by and for the industry and is right in line with a policy which has been advocated in season and out of season by this publication ever since its first issue sixteen years ago. The Florida Citrus Commission should have the hearty and whole-hearted support of the entire industry in this campaign for the better appearance of Florida citrus fruit.

AT LAST—FEDERAL CONTROL

At last, federal control of distribution of Florida citrus fruits appears to be on the way. A tentative agreement formulated by practically unanimous representation of the various groups of growers and shippers of the state has received the approval of Secretary Wallace of the United States Department of Agriculture. This agreement is being submitted to the growers and shippers of Florida and when signed by eighty per cent of the growers and a majority of the shippers, will be put into effect by the Department.

The agreement provides for absolute control of distribution, proration and grade by Federal authorities, action which has long been sought by the citrus interests of the state, but upon the details of which unanimous approval has never before been obtained. The unanimity with which the proposed agreement was received by representatives of the various groups of growers and shippers in the preliminary meetings augurs well for its favorable reception when the agreement is presented for signatures.

While it is now too late to hope that the agreement can be put into operation in time to affect the present shipping season, there is every reason to believe that next season's crop will be marketed under direct Federal control.

Coupled with the campaign now in progress under direction of the Florida Citrus Commission for the production of Better and Brighter Fruit, next season's citrus crop should bring the grower a greater measure of profit than he has realized in recent years.

Present indications point to one of the very largest citrus crops Florida has ever produced. Of course, many things may happen between now and picking time which may affect the final harvest, but the present outlook is for a record production. All of which points to the need of special care that fruit of the best quality and appearance be produced and that only fruit of exceptional quality be put upon the market.

Let's all help make the Better Fruit Campaign a real campaign for Better Fruit.

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NITRATE AGENCIES COMPANY

MEMO: Re: current advertising

Citrus growers should carefully consider the importance of their next citrus fertilizing —

1) Recent heavy rains have used up almost all the fertilizer in the soil.

2) Heavy bloom all over the state will only mature into good sized fruit if a considerable quantity of properly balanced fertilizer is applied —

3) Fertilizer should contain high percentage of good organics (containing sufficient of the rarer elements) in order to last over the summer months.

4) Fertilize EARLY to increase signs of fruit X

Ken

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Zinc Sulphate

Progress In . . . Zinc Sulphate Studies

A. F. CAMP, HORTICULTURIST, AND
WALTER REUTHER, LABORATORY ASSISTANT

It is not our intention to give a detailed report on the zinc studies at this time, what remarks are made will be primarily an introduction to a field trip to our experimental plots. This trip will follow this session and we hope that those interested will be able to go.

Before entering into a discussion of the work we wish to stress one point which was made last year namely that zinc salts are useful in the correction of frenching or mottle leaf of citrus, but so far have not been found valuable in the treatment of other troubles of citrus.

The zinc sulphate is recommended for trial in cases of true frenching but at this stage is not recommended for so-called bronzing or copper-leaf and other troubles. This warning has been made necessary by the great interest shown in the use of zinc salts with the result that they have been assigned to a great many virtues which they do not, in reality, possess. This is to be expected when any new remedy is made available, but at the same time the grower should take care to inform himself concerning the actual results of research work and to utilize the treatment only as recommended or else to apply it in only a limited way for experimental purposes. Zinc is distinctly not a shotgun remedy and should be used only on the basis of the actual research work to date.

Time of Application

In the experiments to determine the best time of application we have found this related to the condition of the tree. Sprays put on just before a flush bring a strong response with the appearance of the flush, whereas sprays put on after the fall flush do not show very satisfactory results until the following spring. In general it may be said that the best results were obtained from applications from February 1st to July 1st, and less satisfactory results during the latter half of the year. This was probably accentuated last year by the very dry weather in the central part of the state so that there was practically no fall flush in the groves used in that area. At Vero Beach, however, August sprays showed a definite response on the fall flush.

Amount and Character of Aplications

Soil applications continue to give unsatisfactory results in the citrus belts. Applications of 5 to 15 pounds per tree on badly frenched trees brought a slow response in most cases. The response, however, could not be compared with that obtained from one spray applied in the spring. Smaller soil applications have not given good results and there are some indications that larger applications may damage the trees. Spraying is still the only recommended method of application for citrus.

A considerable amount of experimenting was done last summer in an effort to determine the concentration of zinc necessary to give results in sprays. The results of much of this work were unsatisfactory due to the the dry weather and the December freeze. As a result of the latter a number of plots had to be abandoned before the work was complete. Other experiments, however, are now underway and we hope by next year to indicate definitely the concentration necessary to produce results with one or more sprays, and also to answer the question of frequency of applications. So far as the few uninjured (by cold) plots were concerned it appeared that one spraying per year was about as good as two or more.

A considerable amount of work is being done on the form of zinc in the spray. While the zinc-lime spray was used in most of the early experiments much work is being done this year with zinc sulphate in lime sulphur, Bordeaux mixture and oil emulsions and also with some commercial sprays made up by allowing zinc salts to react with lime, and then drying the precipitate. The latter sprays are used in the control of bacterial spot of peaches and are comparatively simple to use. The whole problem of the type of spray is tied up with problems of insect and disease control. Does the addition of zinc sulphate to lime sulphur reduce its value as an insecticide, does zinc-lime kill friendly fungi and consequently bring on scale infestations, does zinc help in the control of scab and melanose? The assistance of the Pathology and Entomology Departments has been solicited for this work and we believe they will be able to check all plots this year and help to answer these perplexing questions which have a very considerable bearing on the recommendations to be made. This work is all in progress and if things go well this year detailed reports should be forthcoming next year that will clear up many of these points.

For the present the following spray is recommended for use on frenching:

5 lbs. 89% zinc sulphate
2½ lbs. high grade hydrated lime
50 or 100 gallons of water (100 gallons for light cases of frenching)

After considerable experience last year the following suggestions are given for making the above spray.

1. If the zinc sulphate is lumpy screen dry and pulverize all lumps.
2. Fill sprayer ½ to 2-3 full of water.
3. Start agitator and add zinc sulphate very slowly—DO NOT use the screen.
4. Screen in lime and spreader with water.
5. Use the spray immediately.

For a zinc-lime sulphur spray make up a 5-2½-100 zinc-lime spray as above recommended and add lime-sulphur solution LAST. The use of zinc sulphate in lime sulphur without the addition of lime is not recommended at present as it throws down too much sulphur and may affect the insect kill.

For Bordeaux with zinc sulphate added, we have had success with a spray made up as follows:

2 lbs. copper sulphate
4 lbs. hydrated lime
2 lbs. zinc sulphate

make up as a regular Bordeaux using

(Continued on page 14)

Citrus Aphids

Control Of Aphids On Citrus

By J. R. Watson

Citrus aphids are scarce at the present time, due undoubtedly to the unfavorable weather conditions of the fall and winter. You will remember that the fall was very dry and the early part of the winter very cold, with the result that there was practically no new growth on trees, hence no food for aphids. Present indications are that this is not going to be a bad year for citrus aphids. Nevertheless, some groves will undoubtedly suffer more or less, particularly those varieties which are late in putting out their new growth, such as tangerines, etc. There are enough aphids around in various places to start an infestation later in the season, should weather and growing conditions be favorable. Therefore, we should not be too confident at this time that we are going to get by without injury. We must remember the great rapidity with which the citrus aphid can breed. They begin to have young when only six days old, and their average reproduction when conditions are favorable is six young per day. Have you ever stopped to figure what this means? It means that a female, and they are all females as far as we have ever seen in the citrus belt, at the end of a week could have 42 daughters and 36 granddaughters. At the end of two weeks, in her middle age, she could have 84 daughters and 1,396 granddaughters and 684 great granddaughters. In her ripe old age, at the age of three weeks, she could have 2,000 granddaughters and 7,776 great granddaughters; a total of nearly 10,000 decendants; and at the end of four weeks there would be living to revere her memory 160,000 decendants. This is supposing, of course, that none die and there was plenty of food. As a matter of fact no such rapid reproduction takes place in nature but it does emphasize the immense possibilities for reproduction if conditions are favorable. Like other insects, aphids have their enemies, predators and parasites from which they cannot run away and they make no attempts to run away. They show no fear whatever of their most deadly enemies. Their methods of getting along in the world is to breed so fast that after their enemies have had their fill there will be a few left to carry on the species. Among these enemies are ladybeetles, aphid lions, and especially certain fungi and bacterial diseases which often sweep them off in great numbers, but this does not usually happen until late in the spring.

Citrus growers all know, of course, what damage aphids can produce. If abundant enough they may absolutely stop all development of the spring flush of growth, including blossoms and fruit. The curled leaves are but one phase of the destruction they produce.

It is only on the spring flush of growth that aphids are usually a serious menace. If we can protect this flush of growth from the aphids we can afford to ignore them the rest of the year. Therefore it is an excellent insurance at the present time to take measures to delay the infestation. What few colonies there are in the groves at this time should be destroyed. If they are out on the ends of slender branches they may be bent over into a bucket containing some good insecticide, like nicotine with soap or other spreaders. In places where they cannot readily be bent into a bucket they can be spot dusted. For this purpose choose a time when there is absolutely no wind and the temperature is above 60 degrees F., dust all colonies with a 3% nicotine sulfate lime dust. This will be very effective if weather conditions are suitable. There is no use dusting in the wind. Even enough wind to sway the Spanish moss in the trees is too much to get a good kill of the aphids by spot dusting.

If one is to control aphids he must do a thorough job, more thorough than is ordinarily done for other citrus pests. For instance, in checking up behind a spray crew in citrus groves you will usually find that about 85% of the foilage and fruit has been covered. This is an average commercial job. It we do no better than this in the control of citrus aphids let us stop and consider what happens. Ffteen per cent of them are left alive, 15 out of every 100. Let us say that half of these are mature females bringing forth young at the average rate of six per day. It will readily be seen that in 48 hours the 15 aphids which escaped will have reproduced the original 100, provided they are not hindered by predators and parasites. In other words, the average commercial spraying, such as is usually done for scale insects or rust mites, will check the development of the aphids only about two days.

A most excellent way to deal with aphids on young trees, and it is on young trees that aphids always get their first start, is to construct some tents, consisting of unbleached muslin stretched over a frame work of telephone wire. A battery of a dozen of these tents will be sufficient. By placing these tents over the trees and dusting the average kill has been 99.4%. In other words, for purity we have beaten Ivory soap by 2 points. With this percentage of kill the spring flush will be over before the four aphids which are left will be able to reproduce the original 1000.

One other important thing a grower can do to protect his spring flush of growth from aphids is to push the growth as rapidly as is practicable by fertilizing and cultivating his grove. As soon as the danger of a severe freeze is over, and we have never had one after this date in the main citrus section of Florida, apply the spring fertilizer and start cultivating the citrus. Push out the spring growth on the trees and get it full-grown and hardened up before the aphids begin to fly generally. As has been pointed out before, from the standpoint of their ability to migrate there are two forms of aphids, the winged form and the wingless. When the flush of growth has just started in the spring and there is an abundance of food, only about one aphid in ten ever develops wings. The result is that the majority of them cannot move except by crawling from one branch to another so that their ability to migrate is practically limited to the tree on which they were born. But when the growth begins to harden up on the trees 90% of the aphids may develop wings and if the growth on that particular tree is no longer suitable they will fly away in all directions looking for suitable pastures, so it usually happens that when the spring growth hardens up the aphids migrate in large numbers. This usually happens about the middle of March.

(Continued on page 14)

Florida State Horticultural Society

Florida State Horticultural Society To Meet At DeLand May 5, 6, 7, 1936

The Forty-Ninth Annual Meeting of the Florida State Horticultural Society is to be held in DeLand, Florida, on May 5, 6 and 7, 1936. As usual, new developments of the year in citrus and other lines of horticulture in Florida will be discussed and ways and means considered for betterment. The program is now being arranged and among the topics to be discussed are: Present Day Knowledge of Fertilizers; The Major Food Elements for Citrus Trees; Soil Organic Matter; The Use of Color-Add; Fruit Development in Relation to Grove Practices; Factors in the Maintenance of Markets; Our Wobbly Rate Structure; Different Types of Yellowing in Citrus Trees and Their Structure; Different Types of Yellowing in Citrus Trees and Their Treatment; Relation of Foliage to Yield and Quality of Citrus Fruits; The Wooly White Fly; A Master Spray and Dust Program for Citrus; Our Present Maturity Standards; The Plight of Grapefruit; The Citrus Commission and Its Work; Citrus Advertising; The Fruit Frost Service and other subjects.

Sub-tropical fruits including Limes, Avocadoes, Mangos, Guavas and other fruit will receive consideration in the program of the Krome Memorial Institute. A program on Ornamental Plants from the Horticultural Viewpoint is being considered, complimentary to the Garden Clubs and others interested, in the DeLand Section.

DeLand is preparing an extensive entertainment program for the Society and expect to have a program that is new, novel and entertaining.

The meeting opens on Tuesday night, May 5th and continues through Wednesday and Thursday, May 6 and 7th.

PROGRESS IN ZINC SULPHATE STUDIES

(Continued from page 12)

the copper sulphate and all of the lime and then add the zinc sulphate slowly with the agitator running. You will note that sufficient lime is added to satisfy both the copper sulphate and the zinc sulphate. The fungicidal value of this remanis to be determined and too much dependence should not be put on it for the control of melanose.

Considerable work is in prograss on the effect of zinc sprays on the fruit. This work covers too short a period to be of authoritative value, but some trends are of considerable interest. The fruit on badly frenched trees is usually small, hard in texture, low in juice and very low in acid. Not infrequently it is badly ammoniated and when this is the case the amount of nitrogen in the pulp is abnormally high. Analyses of fruit from trees sprayed last summer showed that the use of zinc, even after the fruit was set, increased the acid and juice content material and while it did not eliminate the symptoms of ammoniation that were already present, it did reduce the amount of nitrogen in the pulp. While such fruit was not exactly normal in composition the changes were all in that direction. Much information along this line will be accumulated this year on crops set the year following spraying. The effect of zinc sprays on maturity and color is particularly important and is being intensively studied.

In the trip to the experimental plots this afternoon we wish to call attention to several points. The layout is not easy to look over as the area in which frenching was severe was very irregular, and consequently treatment dos not show up as well as they do in other groves which were entirely frenched. A central point has been selected where effects of sprays and soil treatment can be seen to best advantage and the trees properly labelled. We wish to call attention to the fact that leaves which were frenched, when the spray was put on, have turned green but have not grown appreciably in size, that the new growth is both green and normal in size, that soil treatments are not as effective as the spray, though a 10-pound soil treatment gave fair results; also note that one spraying was apparently as effective as two sprayings. Other results will be self-explanatory.

CONTROL OF APHIDS ON CITRUS

(Continued from page 13)

Up until that time practically all the aphids which will infest a man's grove have been raised in his own grove. It makes little difference what his neighbor does as far as protecting his own grove is concerned, but after this spring flight starts in it is very difficult to protect one's grove from aphids flying into it. Therefore the wise grower will attempt to get the spring flush of growth well along and hardened before this spring flight takes place in the latter part of March.

From faraway India, Prabhakar Lakshman Kirloskar has come to Florida to study citrus and other fruits. The young man, whose home in in Vadi, India, recently enrolled as a special student in the University of Florida College of Agriculture. He has also done some work at Cornell University.

The most important single cause of automobile accidents is too much speed in the wrong places, says the U. S. Bureau of Public Roads. Especial caution is advised on curves and hills.

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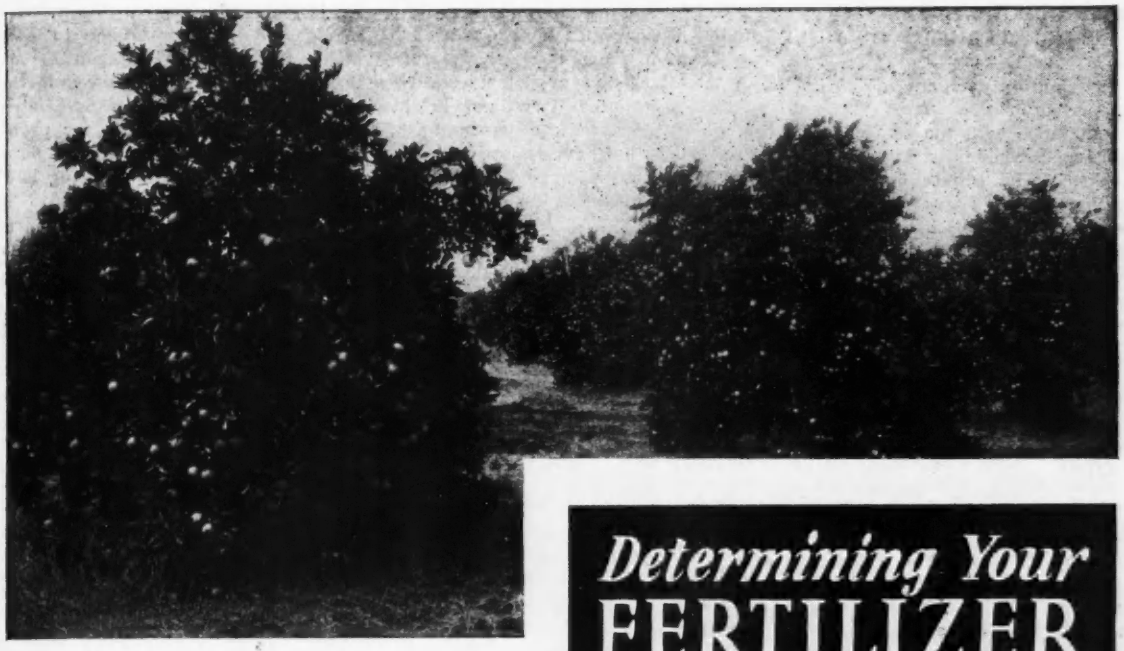

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LAYING FOUNDATIONS FOR BRIGHT FRUIT CAMPAIGNS

(Continued from page 5)

the period of this writer's intimate acquaintance with the Florida citrus industry. During nearly all this time he has heard the question of better-looking fruit discussed whenever growers gathered. Debate on the subject almost always was opened, at the old Citrus Seminars and in State Horticultural Society meetings, by workers from the Agricultural Experiment Station.

When a business associate attended a session of the Horticultural Society at Miami about 1910, the interest aroused by the speeches advocating bright fruit was so great as to impress him that the developing markets in Florida for certain spray materials and like supplies would mean great opportunities for clients who manufactured goods in these lines.

Burton, Gillett, Temple and the other pioneers in the Florida Citrus Exchange were forever talking about improving the outer appearance of fruit. Crutchfield and Woolfolk preached the gospel of attractive oranges and grapefruit long before they organized the American Fruit Growers to practice it. Leaders in the industry have been consistently on the bright fruit band-wagon.

Growers were much less impressed with the need, in the old days, than the shippers and the marketing agencies. Resentment cropped out every now and then, directed partly at the Experiment Station and in part towards the commercial interests, because the penalties placed on discolored fruit were recurringly emphasized.

Old Angles of the Situation

Fruitmen from the Marion county hammock areas, the Manatee River lowlands and all up and down the Indian River region used to get much satisfaction from the finer texture of the citrus they grew in these preferred locations. "How can bright fruit best be raised?" they would ask, answering their own questions with the assertion, "Move to Marion county!" (or Manatee or the Indian River country.)

A magazine article was once written in which the author expounded the theory that color and texture were controlled by the soil in which trees had been planted. Blood oranges called for red clay, bright fruit came only from the California sands which reflected the shades of the Golden Gate. Fortunately the manuscript fell into the hands of a Floridian, and was never published.

If the conclusions set forth in the story had found their way into print, wholesale removals of Florida growers to the Pacific Coast might have followed. Or, perhaps more of them would have gone over on the East Coast and dynamited holes for trees in the localities where Dade county's "coral strands roll down their golden sands"—and produce excellent fruit.

Under considerable headway when the world war broke out, the bright fruit movement of twenty-odd years ago was given a severe set-back by that catastrophe. Florida grapefruit and oranges were orphans or step-children in the eyes of Uncle Sam as he went forth seeking to enlarge agricultural output for feeding the fighting forces.

Chemical plants were thrown into munitions making. Spray materials and fertilizers became scarce and high-priced. Fruit was not food in the estimation of most military authorities and war-time statesmen. Returns from groves dropped so low that proper upkeep was in many cases out of the question for several seasons.

Along about then, another northern advertising expert was brought into the state, this time by the narrator. After making a survey of conditions, the visiting genuis concluded that Florida would soon be raising only russet fruit and never again turn out any other kind. So he proposed advertising it, as sweetest and juiciest.

Making a virtue of necessity in that manner seemed for a while as if it might prove to afford the best way out of the difficulty. Men of level-headed judgment agreed that the proposal had much to commend it. Wiser minds argued against any such confession of defeat as would have been involved in acceptance of the idea.

Research specialists at the State Agricultural Experiment Station coincidently were continuing to live amid the ancient antagonists of bright fruit, finding improved methods for combatting them. Associates on the staff plunged into the problems of growing, packing and shipping costs, seeking and learning how to reduce these.

Investigated also, in other departments of the agency, were conditions affecting the color and texture factors, with the findings frequently proving informative and helpful. Soil fertility in particular was developed as of major significance, and the types of plant food supplied trees was shown to have great importance.

Organization followed in the affiliated institution, The Florida Agricultural Extension Service, of a special division devoted to citrus demonstrations. Citriculturist E. F. DeBusk took up his treks through the groves in many counties and the sands of many groves. District agents and fellow-workers assisted materially.

County farm agents in the citrus belt gave hearty cooperation, dealing direct with growers on numerous occasions almost every week and arranging for many meetings addressed by Extension Service specialists from Gainesville, which have been well-attended as a general thing, during practically every summer of the recent past.

Bright fruit proponents gradually fought their way back until they once more had the evils of discoloration on the run. Industry ups and downs of course retarded progress, but most of the gains were held.

And so, the time has come when all good and true friends of citrus culture will rally in the aid of the bright fruit party, organized as never before to the end that quality may be adequately controlled by the State of Florida.

Foundation work for the building that is planned, and on a good deal of the walls, has been well-done, if slowly, in past movements and under specifications supplied by the state farm service agencies.

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THE USE OF FERTILIZER ON FLORIDA SOILS

(Continued from page 9)

specifically mentioned, the general principles given to apply to these crops as well as to the annual crops.

While the importance of fertilizers for the growth of crops has been stressed, fertilizers alone will not insure good crops. Good seed or plants are essential; likewise the adequate control of insects and diseases, the correct use of irrigation water, if in irrigated territory, proper drainage and poper soil reaction all are fully as important as is the use of proper fertilizer formulas and amounts. Unless a farmer or grower is able and willing to exercise some control over these factors, it is a waste of time and money to use fertilizer on any soil.

TENTATIVE APPROVAL GIVEN FLORIDA CITRUS AGREEMENT

(Continued from page 8)

increase returns for an industry from which approximately 20,000 growers derive their incomes. The annual value of the Florida citrus crop accounts for over 98 percent of that state's farm income from fruit and nut production, and nearly 50 percent of the total farm income from all principal crops produced there. In recent years the income of Florida citrus growers has been decreasing while production has been increasing. For the five seasons ending 1929-30 the total farm value of the Florida citrus crop averaged $30,800,000, and declined to an average of about $22,000,000 during the last five years. The farm value of last season's crop was approximately $23,000,000. The average annual production of oranges and grapefruit increased from 20,393,000 boxes for the 5-year period 1925-26 to 1929-30, inclusive, to an average of 30,025,000 boxes for the five seasons ending 1934-35.

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Interesting Florida Facts

(First of a series of articles prepared by the Department of Agriculture.)

The number of inquiries received from people in all walks of life requesting information relative to Florida as a place to live, as a place to make a living, and as place to enjoy living make necessary the publishing of this series of articles.

Florida's resources, industries, and advantages are many and varied. A great many changes have taken place within our state. Since the year when the State's Constitution was adopted there has been such growth that were it possible to place the State Departments side by side during the early days of Statehood with those same Departments of the bustling present they would not be recognized.

The growth of agriculture and horticulture in Florida has been tremendous and the growth of the other departments administered by the Department of Agriculture has not lagged in expansion. Today the activities of this department require a staff of executives of greater versatility and executive ability than that of many of our large industrial plants.

Our readers will be interested to learn that the Constitution adopted in 1885 outlined the duties of the Commissioner of Agriculture as follows: The Constitution states that he shall perform

1. "Such duties in relation to agriculture as may be prescribed by law.
2. "Shall have supervision over all matters pertaining to public lands.
3. "Shall keep the bureau of Immigration.
4. "Shall have supervision of the State Prison.
5. "Shall perform such other duties as may be prescribed by law."

From the foregoing it will be readily seen that this department is not limited to assisting the agriculturist. This explains why the publishing of a multitude of reports, bulletins, etc. became necessary. Nearly one hundred publications dealing with almost every phase of human activity within our State, from State Government to Household Helps and Recreation have been prepared for distribution. These publications have all served their purpose in making Florida a better place to live.

In an effort to bring the contents of these publications to the attention of the residents of our State we shall tell our readers something of what many of them contain. The result, we believe will be an increased interest and a more comprehensive knowledge of Florida's exceptional advantages, through a wider distribution of these reports, booklets, folders and pamphlets.

So completely has this work been done that no one need be excluded from obtaining the information they desire. The industrialist, the manufacturer, the transportation executive, the retail merchant, the wholesaler, the lawyer, the doctor, the agriculturist, the horticulturist, the botanist, the beekeeper, the frog-farmer, the timberman, the college professor, the school teacher, the rural dweller, the student, the school boy or girl, the housewife and the day worker will each find interesting facts that will enable them to receive greater benefits from living in Florida.

The first publication we call to the reader's attention is entitled "KNOW FLORIDA".

This will be found to be a very interesting folder. It is easily read and has been printed with an attractive cover in colors. The purpose of this folder is to acquaint our residents with some of the advantages of the Sunshine State and to attract permanent residents to our State. When folded it can be easily carried in the pocket.

The various sections of this folder deal with the Physical Facts of the State, and the short articles under the headings of "State Department of Agriculture", "State Marketing Bureau", "Inspection Bureau", "Division of Agriculture and Immigration", "State Chemist", "The Citrus Industry", "The Vegetable Industry", "Poultry Raising in Florida", "Florida Livestock", "Sub-tropical and Non-Citrus Fruits", "What Florida Offers Capital", "Fisheries", "Mineral Resources of Florida", "Education", "Transportation", "Recreation in Florida", and "Florida Forests", will interest anyone interested in Florida.

"KNOW FLORIDA" is a piece of literature which should be mailed to those relatives and friends of yours in other states who might some day decide to visit or to make Florida their permanent home. A postal card addressed to Nathan Mayo, Commissioner of Agriculture will bring a copy of "KNOW FLORIDA" to you without cost.

Farm Rehabilitation

By JOSEPH L. DAILEY
Assistant Administrator
Resettlement Administration

Editor's Note—Experience in providing both direct relief and rehabilitation for farm families during the recent economic depression taught the Government that it is more practical, more economical, and more conducive to good citizenship to help these distressed farmers help themselves by eliminating some of the causes that forced them on relief. How this is being done is described by Joseph L. Dailey, the man who is directing the rehabilitation program, in a series of three articles, of which this is the last.

The rehabilitation of farmers is accomplished by individual loans, the size and use of which is determined by the farm management plan. These plans take into consideration all possible expenditures of the farm family, and, in order for the farmer to be truly rehabilitated, these two must balance.

But we in Resettlement knew that sometimes a farmer cannot liquidate even a small loan because he is already burdened with such a heavy debt. On the other hand, there are farmers who can liquidate a small loan but a loan large enough to supply certain things which they need cannot be justified in the light of their anticipated income.

Knowing that many a needy farmer's budget could not be balanced because of one or both of these conditions, the Resettlement Administration is carrying on two services which are available to low income farm families regardless of whether they are rehabilitation clients.

The first of these is the farm debt adjustment service which is designed to relieve the condition of overburdening debt. Voluntary farm debt adjustment committees throughout the country are ready to assist any needy farm debtor who applies to them for aid.

These committees arrange for meetings between farm debtors and creditors. They try to work out an equitable adjustment of debts that will permit the debtor to retain his possessions and furnish a basis for his financial rehabilitation and at the same time be fair to his creditors.

The second of these is the com-

(Continued on Page 22)

Soil Conservation and Domestic Allotment Act

AAA Establishes Five Regions For Soil Act Administration

The establishment of five regions, comprising all the 48 states, for administration of the Soil Conservation and Domestic Allotment Act was announced today by Secretary of Agriculture Henry A. Wallace. Regional directors, who will work under the general supervision of H. R. Tolley, acting administrator of the Agricultural Adjustment Act, were named to have immediate charge of the divisions.

The Southern Division is made up of South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Arkansas, Texas, and Oklahoma. Cully A. Cobb, who has been director of the Cotton Division, will be regional director of the Southern Division.

The East Central Division is comprised of Tennessee, Kentucky, North Carolina, Virginia, West Virginia, Maryland and Delaware. John B. Hutson, who has been director of the Division of Tobacco, Sugar, Rice, Peanuts, and Potatoes, will be regional director of the East Central Division.

The Northeast Division is made up of Pennsylvania, New Jersey, New York, Connecticut, Massachusetts, Maine, Vermont, New Hampshire, and Rhode Island. Mr. Hutson will also be regional director of this Division.

The North Central Division is made up of Ohio, Michigan, Indiana, Illinois, Wisconsin, Iowa, Missouri, Nebraska, South Dakota, and Minnesota. Gerald B. Thorne, who has been director of the Division of Livestock and Feed Grains, will be regional director of the North Central Division.

The West Division is made up of North Dakota, Kansas, Colorado, Wyoming, Montana, New Mexico, Arizona, California, Utah, Nevada, Idaho, Oregon, and Washington. George E. Farrell, who has been director of the Division of Grains, will be director of the Western Division.

Secretary Wallace also directed the discontinuance of the four commodity divisions. The work of the former divisions in liquidating the AA production control programs will be part of the duties assigned to the new regional divisions. The order leaves intact other administrative units of the AAA, such as the Division of Marketing and Marketing Agreements, the Division of Program Planning, and the Division of Consumers' Counsel. The Sugar Section will continue to handle quotas and some other phases in connection with a sugar program.

Headquarters of the regional divisions will be maintained in Washington, and those offices will deal directly with individual states. Under the new set-up, however, much of the administrative work of examining and auditing producers' applications for grants and paying producers will be done in the states instead of in Washington.

Mr. Tolley said that establishment of the five regions was one of the necessary steps in getting the new farm program into operation as quickly as practicable.

"We hope to announce details of the new program within the next few days", he said.

Mr. Tolley also announced that under leadership of the agricultural extension services work already has been started to set up field organizations to administer the new farm program in the various states. As under the old program, farmers' county and community committees will take the leading part in local administration.

"In addition to those committees", Mr. Tolley said, "a State Committee will be established in each state. Each of these committees will have from three to five members, the majority of whom will be producers."

The newly named regional directors will carry out those provisions of the amended soil conservation Act which were assigned to the AAA for administration. Also they will continue operations under provisions of the Agricultural Adjustment Act and related legislation.

The Scotch patient was fumbling in his pocket.

"You don't need to pay me in advance," said the dentist.

"I'm no going to," was the reply. "I'm only counting ma money before you give me the gas."—Selected.

Foreman (to small son of workman who has met with an accident): "When will your dad be fit to work again?"

Boy: "Can't say for certain, but it will be a long time."

Foreman: "What makes you think that?"

Boy: "Compensation's set in!" — Selected.

Lee, J. M.

J. M. LEE, Pic.

Formal announcement of the candidacy for re-election was made this week by State Comptroller J. M. Lee. He will make his campaign on the record of his administration.

GERMANY SUBSIDIZING FRUIT INDUSTRY

Citrus Fruit Industry a Trade

A program aiming at increased production of fruit in Germany in order to reduce the nation's dependence on foreign supplies has recently been adopted by the Government, according to a report to the Bureau of Agricultural Economics from Agricultural Attache L. V. Steere in Berlin.

As one step, the German Ministry of Food and Agriculture has placed a sum of 400,000 Rm. ($160,000) at the disposal of the Reichsnarhstand for the subsidization of fruit tree planting. This fund is being allotted to growers who plant at least ten trees. A direct subsidy calculated to cover 20 to 30 per cent of the price of the fruit trees is to be paid. The subsidy is confined to standard types of trees and may not exceed 1 Rm. (40c) per tree.

Plantings are to be limited to a maximum of five basic varieties for each fruit in a particular growing area. The orchards are to be placed under the direct supervision of the State agricultural organizations.

Federal Surplus Commodities Corporation

Growers Ask Funds To Dispose Of Surplus

Two million dollars to help Florida growers dispose of this season's surplus grapefruit and orange crops will be asked of Secretary of Agriculture Wallace by the Florida Citrus Commission. Meeting at Lakeland on March 5, the Commission authorized A. S. Herlong, Sr., Leesburg member to lay the proposal before Washington authorities this week. He will be accompanied to the national capital by Secretary F. E. Brigham and Attorney E. Glenn Grimes.

Assistance of the federal government will be sought under the amended agricultural adjustment act, which allows Secretary Wallace to use 30 percent of customs duties in helping agricultural industries dispose of excessive supplies, either by subsidy of export shipments or by direct purchases for relief agencies. Benefits of the law now are being enjoyed by California prune and citrus growers, the latter under an export pool.

More than $90,000,000 is available to Secretary Wallace for this type of agricultural relief during the year which ends June 30. The Florida citrus industry, represented by the Commission, will ask for $1,000,000 for oranges and $1,000,000 for grapefruit. Prices and methods for handling surplus fruit will be determined later under an agreement with the United States Department of Agriculture.

Plans for promoting the sale of large sized oranges during the remainder of the season were approved by the Commission. The economy in purchasing large fruit at prevailing prices will be emphasized in advertisements appearing in 99 newspapers in Northern markets. Report of John D. Clark, Waverly, on cooperation with the canners in advertising canned Florida grapefruit and juice this summer, likewise was accepted.

Thomas B. Swan, Winter Haven member, reported on plans for a campaign to encourage the production of more bright fruit, in which the Commission will have the cooperation of various state agencies. Earl W. Hartt, Avon Park, was appointed to represent the Commission on an advisory committee which will supervise this effort.

Chairman L. P. Kirkland and Secretary Brigham were authorized to conduct hearings in cases where special permits of fruit dealers have been suspended. When violations of regulations are established the permits then may be revoked by the Commission.

The federal government told the Florida Citrus Commission that it will help the growers of this state by purchasing their surplus orange and grapefruit crops when the industry has accepted the proposed marketing agreement and shipments of fruit are regulated.

In a letter to F. E. Brigham, commission secretary, Jesse W. Tapp, director of the division of marketing, Agricultural Adjustment Administration, and executive vice-president of the Federal Surplus Commodities Corporation, promised cooperation in the removal of surplus supplies from fresh fruit markets. He said:

,"When the marketing agreement program becomes effective and if the control committee recommends regulation of shipments, we will cooperate in carrying out a purchase program. Investigation by the Federal Surplus Commodities Corporation indicates possible disposal of a substantial quantity of oranges and grapefruit through relief agencies. We believe that purchases for this purpose can be made effectively to supplement the program of regulation in the interest of producers."

Two million dollars was asked of the Secretary of Agriculture by the Florida Citrus Commission from the $90,000,000 fund available to help farm crop producers dispose of excessive supplies. A. S. Herlong, Leesburg member of the Commission, E. G. Grimes, Bradenton attorney, and Brigham presented the proposal to the Washington authorities, requesting a million dollars for oranges and a like amount for grapefruit.

Further consideration will be given in Washington to a suggestion that the government finance the canning of surplus grapefruit crops to be sold in Europe, reports Secretary Brigham. He said that time is the essence of the present program and that distribution of fresh fruit through federal relief agencies offers the only available method for quickly disposing of a large quantity of fruit in the next few months.

While the Commission has sponsored the effort to get federal funds for surplus crops, it has taken no part in the discussion on the marketing agreement program, which was developed by a committee of shippers in cooperation with Governor Sholtz. It was explained here today that the Commission members have agreed individually to serve as members of the control committee under the marketing agreement, as the proposed agreement provides, in the event they are asked to do so, but that the Commission officially has taken no action with respect to the agreement itself.

E. L. LORD
Consulting Horticulturist.
Grove Advisory Service.
Economical, Safe, Effective.
Why not give your grove a break?
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Winter Haven, Fla.

Intelligent Advertising

Enlarges Business and Profits Simultaneously

Best Business Insurance

Service includes plans, copy, illustration, placing . . . newspapers, periodicals, radio, outdoor, direct-mail . . . based upon critical analysis of the individual business, budgeted on sales.

A Money-Saving Service

30 years personal experience including service to numerous large national advertisers; very complete facilities (Associated Advertising Agency, Jacksonville), also affiliation with recognized advertising agencies in 23 leading U. S. and Canadian cities. Intimate knowledge of Florida and agricultural problems.

Publishers' "recognition" saves administration expense to advertisers, permits money spent to go into actual advertising.

Frank Kay Anderson
Agricultural Advertising
On the Old Homestead, near
Altamonte Springs, Fla.

Serving some of the South's foremost businesses.

Grapefruit

World Grapefruit Production Increasing

World production of grapefruit has increased greatly in the last ten years. It is estimated by the Bureau of Agricultural Economics at about 25,000,000 boxes compared with an average of 15,400,000 boxes for 1925-27.

In view of the large acreage of young and non-bearing trees, the bureau believed the world crop by the 1938-39 season will total 35,000,000 boxes and may even reach 50,000,000 boxes by 1945 if the present annual rate of increase continues.

The United States, Puerto Rico, Palestine South Africa, Brazil, Cuba and Jamaica are the leading producers. In 1926-27 to 1930-31 the United States produced 82 per cent of the world total. Puerto Rico 7 per cent and all other countries 11 per cent. In subsequent years the United States crop has averaged slightly over 83 per cent of the total, the Puerto Rican about 4 per cent and all other countries about 13 per cent.

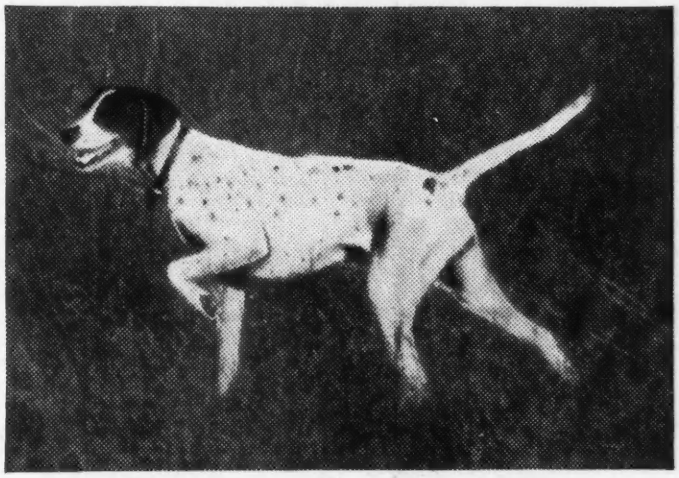
Exports from the United States now represent a smaller proportion of the world's total exports than a few years ago. From 1827 to 1931 the United States and Puerto Rico combined accounted for 77 per cent of the world's average exports of 2,050,000 boxes annually and only 58 per cent of the average world exports of 2,900,000 boxes annually during the five years 1931-35. Competition from Palestine, South Africa and Brazil is the main factor in the declining share of the fresh grapefruit trade of the world held by the United States.

Every indication points to one of the biggest crops the coming season that Florida has ever seen, providing nothing occurs to disturb the situation. Which is a mighty good reason for the growers planning to see that the fruit which is picked from their trees is the very finest that it is possible to raise. Next season as always Quality is going to play a most important part in the grower's balance sheet.

HAYFEVER

ASTHMA and SUMMER COLDS are unnecessary. Complete relief only $1 Postpaid. Nothing else to buy. Over 40,000 HOLFORD'S WONDER INHALER sold last year alone. Mail $1 today for full season's relief to THE DANDEE CO., 252 Hennepin Ave., MINNEAPOLIS, MINN., or write for Free Booklet.

FLIRT, *Field Champion*



Homewood Flirtatious, White and Black Pointer Bitch, owned by H. M. Curry, Jr., Pittsburgh, Pennsylvania.

AMONG all the bird dogs in America, Homewood Flirtatious ("Flirt" for short) stands out the 1935 champion. At the National Championship Field Trial at Grand Junction, Tenn., Flirt proved her mettle. Speed, range, bird finds—Flirt had everything! One perfect creature in whom Nature put that delicate, natural balance of all the elements that make a champion.

The champion Flirt is Nature at her best—one of Nature's rarest masterpieces. She looks like other dogs—four legs, a head, a body, a tail, but she's not just a dog. She's a proud and proven champion—a champion in the field. Another dog may look a little like her—but he's still just a dog.

And here's another field champion, Natural Chilean Nitrate—another one of Nature's rarest masterpieces. Like the champion pointer, Natural Chilean has that proud and priceless gift—something over and beyond mere nitrogen—natural balance of the many fertilizer elements—the vital impurities—the Natural blend and balance that make a champion. That's the vital spark. That's why "Flirt" isn't just a dog. That's why Natural Chilean isn't just a fertilizer.

Natural Chilean contains almost two score of major and minor elements such as boron, magnesium, manganese, iodine, calcium, potassium, etc.—each a vital element in growth and healthy development of plants.

Natural
CHILEAN NITRATE
OF SODA

WITH VITAL IMPURITIES IN NATURE'S OWN BALANCE AND BLEND

FARM REHABILITATION

(Continued from Page 18)

munity and cooperative service which is designed to supplement the farmer's income and at the same time supply those needs which he cannot afford by himself. Through a study of farm plans we can discover wherein there is a lack of certain services and facilities to assist in balancing the individual budget. The Resettlement Administration tries to supply this lack by providing facilities for cooperative use which will bring quick results. With our rehabilitation families this is done by making individual loans for participation in the needed cooperative services, or by a group loan to a cooperative agency made up principally of rehabilitation families.

The old notion that land held in fee simple could be used by the owner exactly as he pleased caused the ruin of many farmers and blinded them to the fact that only through cooperation could they appreciably raise their standard of living.

U. S. DEPT. OF AGRICULTURE BOON TO FARMER

(Continued from Page 7)

(used in the manufacture of soft drinks), lemon and orange oils, pectin (used in jelly making), marmalades, stock feeds and the like. At one growers' cooperative alone the industrial application of this process yielded $400,000 in a year and at another a loss of $100 a month for carting became a stock-feed gross of $40,000 a year."

Summarizing the great work of the department, which has 10,000 scientific and technical employes, many of whom receive small salaries, Fortune says "the department's scientists are men whose achievements rank a great deal higher than the rewards they receive from their country would indicate. Altogether, one bureau with another, it is doubtful if there exists even in that Jerusalem of the civil service, London, any civil service organization of equal value to society."

CROTALARIA INTERMEDIA, new heaviest noduled, best growth cover crop; also forage crop, seed 25 cents per pound. Grand Island Nurseries, Eustis, Fla. Mar-Apr.

IF suffering with Piles, I want to help you. Drop me a line explaining.
Fred C. Whitney
317 6th Ave., Des Moines, Iowa

CLASSIFIED Advertisments

The rate for advertisements of this nature is only five cents per word for each insertion. You may count the number of words you have, multiply it by five, and you will have the cost of the advertisement for one insertion. Multiply this by the total number of insertions desired and you will have the total cost. This rate is so low that we cannot charge classified accounts, and would, therefore, appreciate a remittance with order. No advertisement accepted for less than 50 cents.

2 YR. FIELD GROWN ROSE BUSHES: Red, Pink, Shell, Salmon, White Radiance, Hollande, Columbia, Briarcliff, Sunburst, Pres. Hoover, Victoria, Talisman, Sensation. All 19c each, postpaid. Ship C.O.D. NAUGHTON FARMS, Waxahachie, Texas.

CAUSERIENCE LEPIDOFLOIA — (So-called Brizilian oak), resembles Australian pine. Grand for windbreaks. Cold resistant. Beautiful. Send for sample of foliage. $6.00 per 100. S. F. Matthews, Homestead, Fla.

ALYCE CLOVER, the best legume for hay or covercrop. Write for information. Hardin Groves, Box 63, Lakeland, Fla.

FOR SALE — 80 acres good citrus land, two miles northwest of Cocoa, Brevard County, Florida. Price $1600.00 cash. S. Hendry, City Point, Florida.

FILMS DEVELOPED 2 prints of each 25c; 20 reprints 25c. Pine Photo, Y-5134 Nevada, Chicago.

THRIFTY TREES and budwood from record performance Perrine Lemon parents, Persian Lime and other citrus varieties. DeSoto Nurseries, DeSoto City, Fla.

CROTALARIA — New crop, high quality, double cleaned, scarified Crotalaria Striata seed for sale. Attractive prices. Carolinas' Crotalaria Co., Camden, S. C.

UP to $20.00 paid for Indian Head Cents; Half Cents $125.00; Large Copper Cents $500.00, etc. Send dime for list. Romancoinshop, D. Springfield, Mass.

Large citrus trees for replanting at special low price. Grafted avocado trees and budwood of Perrine lemon and Tahiti limes.
WARD'S NURSERY
Avon Park, Fla.

MEN WANTED—Sell Shirts. No experience necessary. Free samples. Commission in advance. Free ties with shirts. Carroll Mills, 375A Flatbush Av., Brooklyn N. Y.

HARDIN'S SPERRYOLA Lemon, a profitable adapted commercial variety for all sections. Hardy, prolific grower and producer. Limited number choice trees. Hardin Nurseries, Box 63, Lakeland, Fla.

WANTED — Man with from ten thousand to twenty thousand dollars to grow an entirely new orange for the U. S. markets. Cheap lands, no cold, plenty water, no fertilizer. A world beater in an orange. Patented.—Address, Buen Negocio, Gaveta -1, Holguin, Cuba.

PERSONAL

QUIT TOBACCO easily, inexpensively, without drugs. Send address. N. A. Stokes, Mohawk, Florida.

POSITION WANTED — Managing, caring for citrus grove, for good, reliable party. Highest type reference gladly furnished. H. A. KUTER, Elkton, Fla.

WANTED—To hear from owner of land for sale. O. Hawley, Baldwin, Wis.

FREE Booklet describes 87 plans for making $20-$100 weekly, home or office, business your own. Elite Service, 505 Fifth ave., New York City.

CLEOPATRA MANDARIN and Sour Orange root stock. Also Hamlin, Valencia and Persian Lime budded trees. Grand Island Nurseries, Eustis, Fla.

WANTED—To hear from owner having good farm for sale. Cash price, particulars. John Black, Chippewa Falls, Wisconsin.

PUREBRED PULLETS FOR SALE—White Leghorns and Anconas ready to ship. Barred Rocks and R. I. Reds shortly. Several hundred yearling White Leghorn hens now laying 70%. Write or wire for prices. C. A. Norman, Dr. 1440, Knoxville, Tenn.

LAREDO SOY BEANS, considered free from nematode, excellent for hay and soil improvement. Write the Baldwin County Seed Growers Association, Loxley, Alabama, for prices.

FANCY ABAKKA pineapple plants. R. A. Saeger Ankona, Florida.

FOR SALE—Selected budwood and trees of Perrine lemon, Tahiti lime, new varieties tangeloes and other citrus. Ward's Nursery, Avon Park, Fla.

SCENIC HIGHWAY NURSERIES has a large stock of early and late grapefruit and oranges. One, two and three year buds. This nursery has been operated since 1883 by G. H. Gibbons, Waverly, Fla.

NEW COMMERCIAL lemon for Florida, the Perrine; proven. All residents need yard trees, keeping Florida money at home. Booking orders for budded stock for Winter delivery. DeSoto Nurseries, DeSoto City, Fla.

SATSUMA BUDWOOD from Bearing Trees. Hills Fruit Farm, Panama City, Fla.

SEED—Rough lemon, sour orange, cleopatra. New crop from type true parent trees. Also thrifty seedlings. DeSoto Nurseries, De Soto City, Florida.

BUDDED trees new Florida commercial lemon, proven, thin skinned, juicy, scab immune. Also rough lemon, sour orange and Cleopatra seed and liningout seedlings. DeSoto Nurseries, DeSoto City, Fla.

SEEDS—ROUGH LEMON, SOUR ORANGE, CLEOPATRA. Pure, fresh, good germination. Also seedlings linedout size. De Soto Nurseries, DeSoto City, Fla

CROTALARIA SPECTABILIS—Seed for sale. New crop, well cured, bright and clean. Price 25c per pound in 100 pound lots and over, 30c per pound in less quantities, f. o. b. Hastings, Bunnell, Lowell and San Antonio, Florida. F. M. LEONARD & COMPANY, Hastings, Florida.

WANTED—Position as packing house foreman; in citrus business twenty-five years; ten years' experience as foreman; married man. J. R. Henry, Okahumpka, Florida.

Long Range Weather Forecasts Are Being Studied By U. S. D. A.

Th scientific soundness of various methods of making long-range weather forecasts is being studied by the U. S. Department of Agriculture with funds allocated from the Bankhead-Jones appropriation for stimulating basic research affecting agriculture, Secretary Wallace has announced.

Various approaches to a clearer understanding of weather behavior are being made in many places. The Wether Bureau, under a small WPA project, is investigating weather changes in certain regions in the United States and in other countries to discover, if possible, any fixed relationship between conditions at any two or more places. Other institutions—both public and private—are investigating ocean temperatures, terrestrial magnetic phenomena, solar activity, lunar phenomena, and planetary movements as they may affect weather. All these studies, as well as the attempts at long-range forecasting in foreign countries, are to be covered in the general survey now under way. This survey and critical appraisal of methods of long-range weather forecasting in use abroad and by individuals and agencies in this country is designed to give a basis for future research in the Department of Agriculture.

That there is a tendency for the weather to move in cycles, from extremely cold to extremely hot and then back again to extremely cold, is evident in some parts of the country from recent correlations of records kept by several Weather Bureau stations. Since these records go back only a hundred years or so, however, not many cycles—particularly those of 30 to 35 years duration—could be established. To provide a firm foundation for long-range forecasting a great many cycles are necessary.

Generally speaking, says W. R. Gregg, Chief of the Weather Bureau, there is little optimism in Europe over the results of extensive investigations in long-range weather forecasting. Investigations of cycles there have seemed to give encouraging results, only to break down with a succession of failures for a similar period. The Union of Soviet Socialist Republics issues weekly forecasts covering a month in advance, but this system has not been in operation long enough to permit a fair appraisal of its dependability and value.

Any useful and scientifically reliable long-range forecasting method developed by the department's present surveys, Mr. Wallace says, will, of course, be used by the Weather Bureau in extending the range of its forecasts, now limited to predictions of what the weather will be 24 to 36 hours in advance, supplemented by a more general weekly outlook. If, the Secretary adds, there is one chance in fifty or a hundred of discovering anything useful, the expense and effort of the whole project is worth while, for every economic group of the country is bound to benefit from any improvement and extension in this field of service.

From a second survey—on the relationship of weather to crop yields as revealed by studies already made by the Weather Bureau, the Bureau of Agricultural Economics, and various State institutions—the department expects to develop more intensive research into crop yield variations and weather factors.

FIND OTHER USES FOR EXTRA CITRUS FRUITS

Byproducts that may make use of surplus citrus fruits in favorable crop years are being developed by the Department of Agriculture's Citrus Products Laboratory at Winter Haven, Fla.

In the 4 years since the laboratory was established, chemist there have shown that high quality salad oils, as well as solid fats, may be obtained from grapefruit seed, which is about one-third fat or oil. They have made splendid wines from citrus juices by adding sugar. They have made brandies and cordials from the wines. They have developed a method for canning orange juice with a "bite" approaching that of fresh juice, a method which also greatly improves the flavor and keeping quality of canned grapefruit juice.

"Whether or not major industries will come from these discoveries is a matter of economics", says Dr. Henry G. Knight, Chief of the Bureau of Chemistry and Soils.

Termites on citrus may be controlled by dusting Paris green into holes and hollow limbs of the trees.

FLORIDA DOLOMITE

(A natural Carbonate of Magnesium and Calcium)

Sweetens "sour" soil, makes plant foods more available, controls definitely the pH value of the soil, stimulates proper decomposition of organic matter in soil and increases friendly soil bacteria, as well as performing many other valuable functions in the development of fine truck and citrus crops.

Florida Dolomite Company

Pembroke, Florida

Florida Pests Must Be Controlled

A hit or miss program of pest eradication cannot possibly be fully effective.

For years the Orange Manufacturing Company has devoted its entire energies to the study of Florida pest eradication. The members of its organization are Florida men who live in the midst of Florida grove and truck production troubles and who through years of the closest study are in position to offer the patrons of this firm the most efficient service as well as sympathetic and expert counsel on their pest eradication problems.

Our Stock Is Fresh And Our Line Most Complete

We list herewith a partial list of the various commodities with which we can supply you:

ORANGOL SPRAY EMULSION
OBRITE LIME SULPHUR SOLUTION
OBRITE DUSTING SULPHUR
COMMERCIAL SULPHUR
FLOWERS OF SULPHUR
CRUDE CRUSHED SULPHUR
WETTABLE SULPHUR
3% NICOTINE DUST
NICOTINE SULPHATE, 40%
PENETROL
NICOTROL
ARSENATE OF LEAD POYDER
CALCIUM ARSENATE POWDER
DRY LIME SULPHUR
COPPER SULPHATE—Granular Bluestone
COPPER SULPHATE—Snow Form
CALCIUM CASEINATE
COPPER LIME AND OTHER DUST MIXTURES
CARBOLINEUM
CYANOGAS CALCIUM CYANIDE
DRY BORDEAUX MIXTURE
FISH OIL SOAP
HYDRATED LIME
ROCK LIME
TOBACCO DUST
ZINC SULPHATE
BLOOD ALBUMEN
MONOHYDRATED COPPER SULPHATE
PARIS GREEN
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Orlando, Florida